81. (New) The high-throughput method of claim 65, wherein at least about 200 detectably labeled molecules are imaged every 0.10 milliseconds.

82. (New) The high-throughput method of claim 81, wherein at least about 2,500 detectably labeled molecules are imaged every 0.25 milliseconds.

83. (New) A system for use in the method of claim 65, which system comprises:

(i) a sample channel, into which is introduced a sample comprising multiple molecules in free solution, at least one molecule of which is detectably labeled with a fluorescent label,

(ii) a light source comprising or consisting essentially of at least one wavelength of light that causes at least one molecule in said sample comprising multiple molecules that is detectably labeled with a fluorescent label to fluoresce, wherein said light source irradiates said sample channel,

(iii) an imaging means, wherein said imaging means images the position of each detectably labeled molecule in said sample, and,

(iv) a transmission grating, which simultaneously disperses the imaging of the position of each detectably labeled molecule in said sample.

84. (New) The system of claim 83, which further comprises a lens between said light source and said sample channel, wherein said lens focuses said light at normal incidence to said sample channel.

85. (New) The system of claim 84, wherein said laser generates extraneous light and said system further comprises an equilateral prism and at least one optical pinhole before said imaging means, wherein said equilateral prism and said at least one optical pinhole eliminate said extraneous light prior to it impinging on said imaging means.

86. (New) The system of claim 83, wherein said imaging means is an intensified CCD camera.